



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/825,021	04/15/2004	Shannon V. Davidson	064747.1017	7500
45507	7590	04/30/2010	EXAMINER	
BAKER BOTTS LLP 2001 ROSS AVENUE 6TH FLOOR DALLAS, TX 75201-2980			VO, TED T	
			ART UNIT	PAPER NUMBER
			2191	
			NOTIFICATION DATE	DELIVERY MODE
			04/30/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PTOmail3@bakerbotts.com
PTOmail4@bakerbotts.com

Office Action Summary	Application No. 10/825,021	Applicant(s) DAVIDSON ET AL.	
	Examiner TED T. VO	Art Unit 2191	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 February 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>11/11/09,01/27/10,03/31/10</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This action is in response to the amendment filed on 02/17/2010.

Claims 1-24 remain pending in the application.

Response to Arguments

2. Regarding the Applicants' argument to the claims rejected over Keller 1 and Keller 2, where Applicants contend the Keller's fail to disclose determining the original subset.

Examiner respectfully disagrees.

- First of all, merely saying “determining’ the first subset” is only mental and it covers every generic thing. The specification does not show how to implement a patentable manner or any novel determination. It should be noted that anyone who could blankly say “determining”.

Therefore, in Keller 1, the mention of ‘N defines the number of nodes which are not allocatable...’ is more than a determination of a first subset.

- Examiner will withdraw the use of multiple reference of Keller1 and Keller 2 since there is at least one author that has been in both references. Even Keller has been the key author for the references, using these references as a multiple reference will be improper. However, it would be obvious to an ordinary in the art to combine the two references under obviousness. Therefore,

Art Unit: 2191

new ground of rejection would be applied in this office action. Other Applicants' arguments are considered, but they are moot in view of new ground presenting in this office action.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hovestadt and Keller et al. (hereinafter: Keller1) "Scheduling in HPC Resource Management Systems: Queuing vs. Planning", Proceedings of the 9th Workshop on Job Scheduling Strategies for Parallel Processing, Seattle, WA, pages: 1-19, 6-2003 in view of Keller et al., "Anatomy of A Resource Management System for HPC Clusters", 2001 (hereinafter: Keller2) and in further view of Cisco Systems, "Cisco 12012 Gigabit Switch Router Switch Fabric Cards Replacement Instructions",

As per Claim 1: Regarding limitation,

A method comprising:

Art Unit: 2191

determining an original subset of a plurality of nodes, the original subset comprising nodes currently unallocated to a job, each node in the plurality of nodes comprising a switching fabric integrated to a card and at least two processors integrated to the card

(Keller1 discloses the limitation: see p. 15, last paragraph: e.g. ‘the administrator establish’:

“*determining*”, ‘N defines the number of nodes which are not allocatable..’: “*currently unallocated to a job*”.

Note: Keller1 shows nodes as hardware but does not explicitly mention the nodes as comprising:

a switching fabric integrated to a card and at least two processors integrated to the card;

However, Keller2 shows nodes are in Cluster comprising Ethernet Switch (See Keller2: Figure

13, p. 16: It would be obvious to an ordinary skill of the art to combine because the structure of Keller1 and Keller2 are only one structure, but separately described, thus it would help to understand how resources are managed in HPC clusters. Thus it would be obvious to yield predictable results).

Regarding,

the switching fabric allowing node to node communication during execution of a job;

selecting a job from a job queue and executing the selected job (Keller2: i.e. scheduling, p. 6)

using one or more processors of one or nodes of the original subset

(Keller2” further discloses communication and selecting a job from queue: Figures 12-13, see P. 16. And in Figures 15-16: job execution selected via endpoint ports).

Keller1 reference teaches in a HPC an original subset of nodes being determined because they are unallocated. Keller2 shows in a HPC the nodes (in Figure 12) which are hardware-

Art Unit: 2191

executable elements, comprising a switch to allow the elements are selectable and commutable; thus it is obvious to combined with Keller1's nodes which are being determined as unallocated.

However, the references do not mention the "switches" or cards as of "*switching fabric*", argued by Applicants.

Cisco Systems shows switch fabric, switch fabric card, used as the endpoints of Route processors (RP), where a RP executes a job received from such a switch via a scheduler (see Cisco. P. 3: three bold dots and "Switch Fabric Card", and see p. 10, fabric switch).

Thus, it is obvious to an ordinary in the art to include switch fabric cards as disclosed by Cisco Systems into the HPC cluster as shown in Keller1 and Keller2. Such inclusion would be suitable for a replacement in components in which the Keller1 and Keller2 describe the endpoints as a generic switch/network card, and Cisco systems provides the detailed the switch fabric cards. The difference is only a change in shape or ingredient of the components. The replacement would be suitable for a choice of products which are selectable in the HPC.

As per Claim 2: Regarding, *The method of claim 1, wherein selecting the job comprises selecting the job from the job queue based on priority* (Keller1: See p. 3: sec. 2.1 Queuing Systems: queue priority), *the selected job comprising dimensions not greater than a topology of the original subset* (Keller1: See p. 15, last paragraphs: refer to Threshold, and N nodes are not allocatable).

As per Claim 3: Regarding, *The method of claim 2, wherein selecting the job from the job queue based on priority comprises: sorting the job queue based on job priority* (Keller1: p. 3, sec. 2.1); *selecting a first job from the sorted job queue* (Keller1: p. 3, sec. 2.1); *determining*

Art Unit: 2191

dimensions (i.e. Network topology, or see Fig. 1 the axis of Available resources) *of the first job with the topology of the original subset* (Keller1: p. 14, in Mapping, see “static” and dynamic”, and p. 15: “N”); *and in response to the dimensions of the first job being greater than the topology of the original subset* (Keller1: See Fig. 1 and p. 15: “system wide node limit”), *selecting a second job from the sorted job queue* (i.e. ability of the queue systems for using free resources with waiting resource requests (in p. 3), ability of co-allocation, of grouping different dependency graphs of the queue system and planning (sec. 2.1 and 2.2)).

As per Claim 4:Regarding (refer to Keller1 reference) , *The method of claim 2, wherein the dimensions of the first job are based, at least in part, on one or more job parameters and an associated policy* (i.e. resources/against time axis as mentioned in p. 3:1-3).

As per Claim 5: Regarding (refer to Keller1 reference), *The method of claim 2, further comprising dynamically allocating a job space from the original subset based, at least in part, on the dimensions of the job, wherein executing the selected job comprises executing the selected job using the job space* (See sec. 3.2, start at p.6, and noted that the queue systems/planning has an ability to allocate job spare as using the free recourses for waiting request resources).

As per Claim 6: Regarding, *The method of claim 1, wherein the plurality of nodes comprises a first plurality* (Keller1: see node in clusters in p. 1, different dependency graphs, p. 16) *and the method further comprises: determining that dimensions of the selected job are greater than a topology of the first plurality* (Keller1: i.e. number N and threshold T (p. 15));

Art Unit: 2191

selecting one or more nodes from a second plurality of nodes (Keller1: See Fig. 1, and last paragraph in p. 15), *each of the nodes in the second plurality of nodes comprising a switching fabric integrated to a card and at least two processors integrated to the card* (Keller2: See Grammar 3.2.1, p. 15 and Figure 13, p. 16);

and adding the nodes selected from the second plurality to the original subset to satisfy the dimensions of the selected job (Keller1: See the sec. 2.1 and 2.2).

As per Claim 7: Regarding, *The method of claim 6, further comprising returning the nodes selected from the second plurality to the second plurality* (Keller1: see node in clusters in p. 1, different dependency graphs, p. 16, i.e. another job/ node is selected in queuing)

As per Claim 8: Regarding, *The method of claim 1, further comprising; determining that a second job that was executing on a second subset of the plurality of nodes has failed* (Keller1: See last paragraph in p. 15, or the description of System Wide Node Limit (i.e. SWNL), for the case when the user requests a number of nodes $T+N$ greater than the threshold T); *adding the second subset to the original subset; and adding the failed job to the job queue* (the SWNL defines automatically the number N is not allocatable nodes).

As per Claims 9-16: See rationale addressed in the rejection of Claims 1-8, respectively.

As per Claims 17-24: See rationale addressed in the rejection of Claims 1-8, respectively.

Art Unit: 2191

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ted T. Vo whose telephone number is (571) 272-3706. The examiner can normally be reached on 8:00AM to 4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wei Y. Zhen can be reached on (571) 272-3708.

The facsimile number for the organization where this application or proceeding is assigned is the Central Facsimile number **571-273-8300**.

Any inquiry of a general nature or relating to the status of this application should be directed to the TC 2100 Group receptionist: 571-272-2100. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TTV
April 20, 2010

/Ted T. Vo/
Primary Examiner, Art Unit 2191